CLAIMS

What is claimed is:

1. A large area display, comprising:

a pixel layer including display elements;

a connection layer;

drivers in communication with the pixel layer and the connection layer, the drivers configured for driving the display elements in the pixel layer and configured for communicating through the connection layer; and

a laminate formed of the pixel layer, the connection layer and drivers comprising the large area display.

2. The large area display according to claim 1, wherein the drivers are laminated between the pixel layer and the connection layer.

3. The large area display according to claim 1, wherein the display elements comprises at least one of liquid crystal display (LCD), light emitting diode (LED), organic LED (OLED), polymer light emitting device (PLED), electroluminescent (EL), electrophoretic display, electrochromic display, electrowetting, gas plasma and fiber plasma.

4. The large area display according to claim 1, wherein the pixel layer comprises an active matrix display.

5. The large area display according to claim 1, wherein the pixel layer comprises a passive matrix display.

6. The large area display according to claim 1, wherein the pixel layer comprises at least one transistor per pixel.

7. The large area display according to claim 6, wherein each of the at least one transistors comprises a thin film transistor (TFT).

8. The large area display according to claim 1, wherein the connection layer comprises a first conductive layer for providing power and ground connections to driver electronics and a second conductive layer for providing serial data connectivity to an input/output (I/O) connector.

9. The large area display according to claim 1, wherein the connection layer comprises low voltage differential signaling (LVDS) logic for data transmission.

10. The large area display according to claim 1, wherein the drivers comprise complementary metal on semiconductor (CMOS) circuitry on silicon or glass substrates.

11. The large area display according to claim 1, wherein the drivers comprise complementary metal on semiconductor (CMOS) circuitry on plastic substrates.

12. The large area display according to claim 1, wherein the drivers further comprise:
serial data input for receiving display data; and
serial data output for sensing and testing.

13. The large area display according to claim 1, further comprising an input/output (I/O) connector in communication with the connection layer configured for external communication.

14. A large area display, comprising:
a plurality of sub-displays, each of the plurality of sub-displays comprising:
a display element layer for emitting light;
a driver in communication with the display element layer and configured for driving pixels in the display element layer; and
a connection layer in communication with the driver and configured for serial data routing; and
wherein the plurality of sub-displays form a large area display.

15. The large area display according to claim 14, further comprising a bus in communication with the connection layer of each of the plurality of sub-displays and configured for high-speed data communication.

16. The large area display according to claim 15, wherein the bus comprises low voltage differential signaling (LVDS).

17. The large area display according to claim 14, further comprising an input/output (I/O) connector in communication with the bus and configured for interfacing with an external data source.

18. The large area display according to claim 14, wherein each of the drivers comprises complementary metal on semiconductor (CMOS) circuitry on substrates formed of silicon, glass or plastic.

19. A method of manufacturing a large area display, comprising:
providing a pixel layer including a matrix of pixels;
providing a connection layer;
providing drivers; and
laminating the pixel layer, the drivers and the connection layer together to form an operable large area display.

20. The method according to claim 19, wherein providing a pixel layer comprises providing one of a liquid crystal display (LCD) pixel layer, a light emitting diode (LED) pixel layer, an organic LED (OLED) pixel layer, a polymer light emitting device (PLED) pixel layer, an electroluminescent (EL) pixel layer, an electrophoretic display layer, electrochromic display layer, electrowetting display layer, gas plasma display layer and a fiber plasma display layer.

21. The method according to claim 19, wherein providing a pixel layer comprises providing at least one control device for each pixel.

22. The method according to claim 21, wherein providing the at least one control device for each pixel comprises providing at least one thin film transistor (TFT) for each pixel.

23. The method according to claim 21, wherein providing the at least one control device for each pixel comprises providing at least one metal insulator metal (MIM) device for each pixel.

24. The method according to claim 21, wherein providing the at least one control device for each pixel comprises providing at least one diode for each pixel.

25. The method according to claim 19, wherein the laminating the pixel layer, the drivers and the connection layer together comprises laminating the drivers between the pixel and connection layers.

26. A large area display comprising:

a means for emitting light including an array of sub-arrays each sub-array including an array of pixels;

a means for driving each array of pixels of each sub-array of the array of sub-arrays; and

a means for communicating display data, sensing and testing signals to and from a data source to the means for driving the array of pixels.

27. The large area display according to claim 26, wherein the means for emitting light comprises at least one of liquid crystal display (LCD), light emitting diode (LED), organic LED (OLED), polymer light emitting device (PLED), electroluminescent (EL), electrophoretic display, electrochromic display, electrowetting, gas plasma and fiber plasma.

28. The large area display according to claim 26, wherein the means for driving comprises complementary transistors.

29. The large area display according to claim 28, wherein the complementary transistors comprise complementary metal oxide semiconductor (CMOS) circuitry.

30. The large area display according to claim 29, wherein the CMOS circuitry further comprises a silicon or plastic substrate.

31. The large area display according to claim 28, wherein the complementary transistors comprise p-channel and n-channel amorphous or polycrystalline or single crystal silicon.

32. The large area display according to claim 28, wherein the complementary transistors comprise n-channel organic semiconductor paired with p-channel polycrystalline silicon.

33. The large area display according to claim 26, wherein the means for driving comprises a serial data input for display data and a serial output for sensing and testing signals.

34. The large area display according to claim 26, wherein the means for communicating the display data, sensing and testing signals comprises a connection layer for communicating display data, sensing and testing signals between an input/output connector and the means for driving the array of pixels.

35. The large area display according to claim 34, wherein the connection layer comprises low voltage differential signaling (LVDS).

36. The large area display according to claim 26, wherein the means for communicating the display data, sensing and testing signals comprises:

a first layer of metal for providing power and ground signals to the means for driving the array of pixels; and

a second layer of metal for communicating display data, sensing signals and testing signals to and from the means for driving the array of pixels.

37. The large area display according to claim 26, wherein the means for driving comprises drivers having a surface area less than surface areas associated with either of the means for emitting light or the means for communicating display data, sensing and testing signals.

38. An apparatus for manufacturing a large area display, comprising:
a means for providing a pixel layer;
a means for providing drivers;
a means for providing a connection layer; and
a means for laminating the pixel layer, drivers and connection layer together to form an operable large area display.

39. The apparatus according to claim 38, further comprising a means for placing features on the pixel layer or the connection layer.

40. The apparatus according to claim 39, wherein the means for placing features comprises an embossing roller with patterning.

41. The apparatus according to claim 39, wherein the means for placing features comprises low-temperature polysilicon (LTPS) technology.

42. The apparatus according to claim 39, wherein the means for placing features comprises amorphous crystal growing (CG silicon) technology.

43. The apparatus according to claim 38, wherein the means for laminating the pixel layer, drivers and connection layer to form an operable large area display comprises roll-to-roll manufacturing.

44. The apparatus according to claim 38, wherein the means for providing drivers comprises a complementary metal oxide semiconductor (CMOS) fabrication line.